					WEST COAST COLLABORATIVE Public-private partnership to reduce diesel emissions
Bridging the Biodiesel Gap					
Biodiesel Blending Procedures					Procedure #

Biodiesel Blending Procedures

Depending on blending method, feedstock, and blend percentage procedures will differ. In all cases, blends need to be confirmed with a density check. Density meeting specification falls between 0.86 and 0.90 with typical values falling between 0.88 and 0.90.

- 1. Splash-Blending and In-Tank Blending*
- 3. In-Line Blending*
- 4. Rack Injection*

1. Splash Blending

Biodiesel and diesel fuel are loaded into a vessel separately. Mixing of the products occurs as the fuel is agitated through the blending of each fuel and during the transportation and delivery of the fuel to the end user. Because biodiesel is slightly heavier than conventional distillates **it is recommended that biodiesel be loaded second on top to eliminate the biodiesel from settling at the bottom of the blending tank.** When bottom loading is utilized the fuel flow may be adequate to load either fuel being blended first with no negative consequences of these minor viscosity differentials. When splash blending, complete compartment loads should be delivered to a single tank, rather than to a partial compartment or more than one tank.

2. In-Tank Blending


Biodiesel and petroleum diesel are loaded separately, or in some cases simultaneously, through different incoming sources, but at a high enough fill rate that the fuels sufficiently mix and require no further agitation. Sampling is recommended to ensure that the tank blends are homogeneous. If uncertain about the homogeneity of the samples, density checks on the samples will confirm.

3. In-Line Blending

Biodiesel is added to a stream of diesel fuel as it travels through a pipe or hose. The blending occurs as the two products move through the pipe, or once the fuel is loaded, into its receiving vessel.

4. Rack Blending

Inject directly at the rack into the tank truck, similar to current performance fuel additives and red dye.

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Infrastructure Considerations

At the loading rack, there will not be a good, single method to select for blending the complete range from B2 to B100. You must utilize your current assets the best way possible. To begin, select the storage and blending option that meets your needs and is supported by your existing equipment.

Sequential blending is usually the least intrusive and least expensive to add to an existing terminal infrastructure. It is basically a matter of adding a new product to a loading lane at the truck terminal facility. The ultimate result enables a terminal operator to load multiple products at one loading position or at different rack positions through different loading arms.

Preset true ratio blending enables terminal operators to load both products—biodiesel and diesel fuel—at the same time. One meter and control valve per product is required and the blend stays proportional and blends throughout the complete load.

Present batch ratio blending activates both products simultaneously and is loaded at the same time. Like the preset true ratio concept one meter and control valve per product is required but flow ratios are not controlled proportionally, meaning that the product with the lesser volume may finish substantially earlier than the larger product volume. V-Port ball valves allow for more accurate controls of the product stream at different rates and are enabled with hydraulic actuators.

Cold Weather Blending Tips

Biodiesel has a pour point of from 0°C to 18°C—depending on the feedstock of the biodiesel fuel. It is highly recommended that you know the fuel specifications related to the generic percentage of your biodiesel blend. Your fuel supplier should provide this information. The lower your winter operability temperatures for the generic distillate that you intend to blend the biodiesel with, the more reliable the blended fuel will be for winter operability in your region.

Blended fuels can be stored below ground in most climates. Above ground storage—for both generic distillates and biodiesel—should be protected with insulation, agitation, kerosene blends, heating systems or other measures if freezing temperatures are common. These precautions include protecting tank piping and the pumping equipment. These cold weather preparatory recommendations are equally important when storing conventional distillates as well as biodiesel and biodiesel blends.